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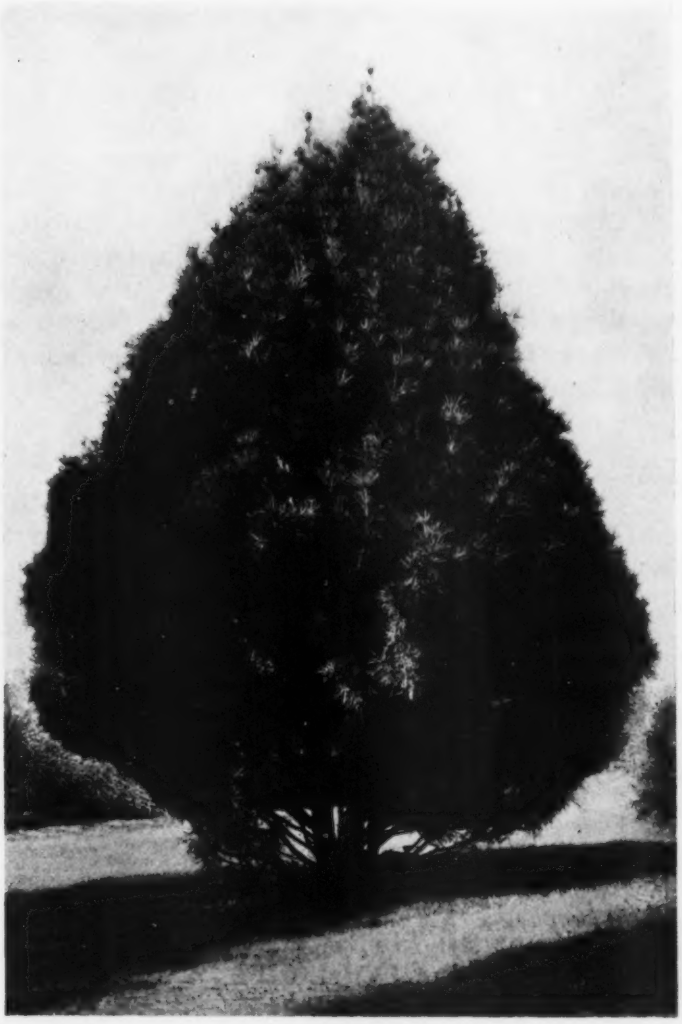

Sciadopytis verticillata Sieb. and Zucc.
Japanese Umbrella Pine

ARBORETUM BULLETIN, OCTOBER, 1938

The Umbrella-Pine, *Sciadopytis verticillata* Sieb. & Zucc., is a native of Central China that was introduced into the United States in 1861 (Rehder). It is an evergreen tree with a regular pyramidal top that may reach a height of 100 feet, and a trunk girth of nine feet. It bears its large, dark-green, needle-like leaves in brush-like whorls that remotely suggest spread umbrellas. The leaves vary from 15 to 35 in a whorl, are straight, stiff, obtuse and glossy, and from three to six inches long. The ovate-oblong cones are from 3 to 5 inches in length, bearing seeds about one-half inch long.

The tree is hardy as far north as Portland, Maine. It is a strikingly ornamental tree in many Philadelphia estates.

The tree photographed for the frontispiece grows near the Swan Pond in the southern part of the Arboretum.

The cover drawing represents the Tea House in the woods near the road west of the Mansion. It was brought from Japan.

The photograph and the drawing were made by Gustave Liebscher.

RODNEY H. TRUE

TREES AS HISTORIANS

THE LONG LIFE SPAN of trees gives them a real interest to us creatures of a mere three score years and ten, for one reason, because of the fact that some of them leave in their bodies a simple record of their conditions of life during the past seasons. Some of them form the so-called annual rings seen in the cut ends of their trunks—wider rings in seasons of prosperity, narrower ones in lean years of drought, or of other kinds of hardship.

This simple record is seen very clearly in kinds of trees in which the growth of the wood is marked by the larger elements of the early spring growth followed by the denser structure of the wood laid down in the latter part of the season. Some trees show annual rings very clearly, mainly because of the large wood vessels laid down in the spring. Among the kinds of wood showing easily-seen rings are the oaks, the ailanthus, ash, elm, hackberry, sassafras, the pines, hemlock, coffee tree, honey locust, and others. Among the sorts in which the rings are less easily distinguished are the maples, poplars, willows, birches, red cedar, apple tree, sour gum, and others. Fortunately, certain of the long-lived trees have well-marked rings that on study may tell tales of the celestial happenings, of drought and of other conditions in their immediate environment, and in any case tell a tale of survival through the centuries. Among these are the "big trees" of California that in their great stumps show a cross-section of hundreds of years of history.

Professor A. E. Douglass, the astronomer of the University of Arizona, discovered that the width of the tree rings of these old trees showed a rhythm of wide rings and narrower rings that coincided with the sun spot periodicity seen by the astronomers. This seems to show that variation in the supply of energy from the sun caused by these spots affects the growth rate of the trees. This gives rise to a recognized succession of ring widths through the lifetime of the trees, that enables the student to date the life period of a piece of timber long since dead and passed into use. From a study of trees of known date of death, it has been possible to extend the pattern of the series of ring widths hundreds of years into the past. By using this scale it has been possible to date old timbers from the prehistoric cliff dwellings with great accuracy. This study of tree rings has developed a technic and a body of information published in a periodical devoted to this combination of Botany and Astronomy, known by the name of "Tree Rings." A file of this periodical may be seen in the Botanical Library at the University.

The tree's rings may point out humble happenings. A certain farmer laid his lack of success in farming to wells drilled for use by a large industrial plant in which much water was used. He laid his failure for the last decade to the underground

drought caused by the pumping out of great volumes of water from wells that he thought were supplied with water from under his farm. Two groups of trees having sharply marked rings were selected for study—a group of oaks near the pumping plant and a group of sassafras trees on the line between the farm and the plant. The rings of the oaks near the plant when measured showed a reduced growth during the decade following the installation of the pumps, and seemed to reinforce the contention of the farmer. The sassafras trees on the farm line toward the pumps, however, showed the highest prosperity during the same decade, arguing against the farmer. The contradiction in the evidence was explained when it was found that a storage tank of crude oil had broken ten years before not far from the oaks. They responded to the damage to their roots caused by the oil. The sassafras trees, remote from this accident, told the true story.

Probably few people remember that almost seventy years ago a railroad went up along the Brandywine through a region now a park in Wilmington, Delaware. In trying to account for the setback shown by a large red oak that fell some years ago in this park, the ring story caused a study of the past to be made. It showed that at the date indicated by the injury shown by the rings, the track passed near this tree, resulting in a severe injury to the root system. This caused the narrow rings, recording unfavorable conditions at that remote date.

Among the early maps of the region now making up the eastern parts of Pennsylvania and of Maryland is one dated 1681, on which a large oak is shown. It still stands as a noble landmark defining a definite spot by which men have oriented their boundaries for generations. Dr. Wildman has told something of its story, as the "Richards Oak," in his little book on "Penn's Trees."

Trees as landmarks is a subject that needs pages for any adequate discussion.

RODNEY H. TRUE

TREES IN TROUBLE

IT WAS THE FORTUNE of the writer to be in New England during the hurricane of Wednesday, September 21st, and succeeding days, and certain general observations on the effect of the conditions on trees seemed worth noting.

To begin with, a rainy week had preceded the day of the wind. The soil was saturated, and water had already been draining away from the forest floors, from the hillsides and the mountain slopes, before the wind came. As a result, the root systems of the trees were in a yielding medium that gave them less-than-normal support. One result of this condition was seen in the landslides that filled the roads in steep places.

On Wednesday, a gusty wind blew at times with a shiftiness that passed into a steadily increasing gale as the afternoon wore on. At about 6 P. M. a hard rain joined the wind. The low clouds drove with great speed inland, and as darkness came on the nature of the situation began to develop. At 6:15 P. M., electric connections failed at Conway, New Hampshire, and candles were hastily brought into use. At North Conway, half an hour later, all was in darkness. A night of wild winds followed, in which chaos seemed to be creeping out of the darkness. Daylight revealed what had been done. The fall of trees in streets, and the destruction of large areas of woodland in the country, closed roads and traffic for long distances. Wires were down in all directions, paralyzing telephone and telegraph service, isolating many communities and leaving them without light and heat. Refrigerators without cold upset the restaurants, where ice cream melted and meats threatened to spoil.

Nevertheless, the clear atmosphere of Thursday brought the mountains wonderfully near, and the brilliance of fall colors was already at hand. Landslides, however, cut off some of the roads in the Notches for the time being. Everywhere was activity in clearing the streets and roads of fallen trees. Men were on roofs of houses trying to protect the places damaged by the fall of great trees. For long stretches there was hardly a yard that had not suffered the loss of one or more of the great white elms that make New England villages so attractive.

By Friday time enough had elapsed for the water to get into the larger channels, and rivers became a source of trouble. In attempting to escape from the chaos of fallen trees, damaged houses, lack of light and tangled telegraph and telephone wires, the driver went where he could in the direction he wanted to go, and drove as far as he could. By Friday, evidence of help from outside was at hand, when perhaps half a dozen repair trucks bearing Pennsylvania licenses were seen working on the broken and tangled wires. At one place the bridge was awash, but it still held; a great manufacturing plant was nearly burned out in the second day of disaster; the streets were full of ruined trees being cleared to make way for cars, and the place was under martial law. Slouching civilians with guns on their hips were helping the veterans, distinguished by their overseas caps. By night, South New Hampshire was reached, but again the city was at the candle-light stage. One street entrance to the main thoroughfare had accumulated tin roofs that had rolled to the ground; a church steeple was still on the church, but hanging at a dizzy angle; the trunks of the great elms that had made the town most attractive were still in the street, and barriers to commerce in the prevailing darkness. An empty gas tank had burst from underground and turned up sidewalk and street. Restaurants lighted by candles served food. The manager of a neighborhood hardware store, under command of an officer in charge, could not close up, though darkness was coming on, because of the constant need of shovels, axes, roofing materials, and other things in his store. He

was ordered to keep his store open until the military control told him to close. Crews of men were brought in trucks to points of special need, and in one place tired prisoners in charge of officers were being marched into their place of confinement.

At last, escape from chaos, being handled competently and bravely, was possible, but the tremendous losses in homes, in trees that made the towns beautiful, and in financial values wiped out in the fall of extensive forest growths, remain.

The trees chiefly concerned in the events noted behaved each in its own fashion. In the saturated soil, shallow-rooted trees were usually tipped over, with root systems bearing a load of soil or stones thrust up into the air. Such trees less often broke to pieces, but many large branches were often split off. The large white elms, poplars and pines were usually tipped over. The more deeply-rooted sorts were less often overthrown, but rather broke off or broke up, with a part of the trunk still upright. The rock maples and oaks often behaved in this way.

The trees fallen in groups in the forests form hopeless tangles, from which the logs will be hard to retrieve. Moreover, these twisted and wrenched logs will not be very acceptable for lumber. For firewood the cost can hardly be met by the low value of the product that is now available in such large quantities.

Among the different kinds of harm wrought by the storm, the great financial losses are strikingly exhibited, but how is the loss of the great trees from the homes, of which these sturdy citizens have been a part of the everyday life of people for generations, to be assessed?

It is a matter of deep regret to all botanists and lovers of beauty to learn that the Arnold Arboretum near Boston suffered severe losses from the hurricane. Unfortunately, not only was the loss in numbers of trees very great, over 1500 trees, but many old and many rare trees were blown down.

THE ANNUAL BUS TRIP

The Fifth Annual Botanizing Trip of the Morris Arboretum and the Department of Botany took place during the week of June 6, 1938. As in the past, the expedition was organized by Dr. Rodney H. True, the party was made up of members of the staff and graduate students of the Department of Botany. The purpose of the trip was to make an intensive study of the flora of a section of Pennsylvania, not previously explored by botanists from the University.

Since preceding bus trips have covered that portion of the state lying to the east of the Susquehanna River, the present itinerary was drawn up with a view to

visiting the area slightly to the west and the north—an area lying chiefly in Bradford, Sullivan, Columbia, Luzerne and Lycoming Counties. In each of these counties numerous stops were made and large numbers of specimens collected.

Leaving Philadelphia early on Monday, June 6, the party proceeded northward by way of Reading and Pottsville to Centralia in Columbia County, where the first stop was made for the purpose of collecting. The habitat was that of a dry acid hilltop capped by scrubby oak growth and supporting the predominant ericaceous flora characteristic of such a site. The most noteworthy feature of the vegetation was the prevalance of a dwarf species of Juneberry *(Amelanchier stolonifera)*.

The bus then continued northward to Willow Springs, along the East Branch of the Susquehanna River, west of Berwick, which marked the end of the day's run. Here considerable collecting was done along the north shore of the river. The rich alluvial thickets were full of interesting plants, among them the Sandbar Willow *(Salix longifolia)* and the Water Willow *(Dianthera americana)*.

On the following day, June 7, the party began working westward and northward. In an endeavor to see still another type of habitat within the same county, a rich wooded slope a mile and a half north-northeast of Iola was selected as the first stop. By deploying fanwise up this hillside, the members of the party were able to attack it over a front of half a mile. When they reassembled at the bus an hour later to compare observations and specimens, it was found that many worthwhile species had been collected. The flora was decidedly boreal in character, as attested by the occurrence of such plants as Mountain Maple *(Acer spicatum)* and Fire Cherry *(Prunus pennsylvania)*.

Abandoning Columbia County for the time being, the bus moved on into Sullivan County where, during a brief stop for lunch at Muncy Valley, some very intensive collecting was accomplished. Many of the same species which had been collected in Columbia County were now taken again, in order to have them represented in the herbarium from a new county. In addition, numerous plants which had not been found before were now brought to light, such as Painted Trillium *(Trillium undulatum)*, Clintonia *(Clintonia borealis)* and Bunchberry *(Cornus canadensis)*.

Turning westward now, the bus ran before a heavy wind and rainstorm to Montoursville, in Lycoming County, which had been selected as the destination for the night. Here, along the West Branch of the Susquehanna River, the closing hours of the day were devoted to an exhaustive scrutiny of the alluvial beaches and thickets at the water's edge. Here, again, were Sandbar Willow and Water Willow and many of the same species seen along the East Branch of the river the preceding afternoon. Perhaps the most interesting novelty was the Leatherwood *(Dirca palustris)*, a few scattered plants of which were detected by Miss Mildred Travis.

Wednesday morning, June 8, found the party exploring the wooded hills along the Loyalsock Creek, north of Loyalsock, a region noted for its wild and rugged beauty. The slopes were covered with a thick growth of hemlock and rhododendron, among which were scattered many boreal or Canadian species, such as *Lycopodium annotinum* and *Coptis groenlandica*. Resisting the temptation to spend the entire day on these fascinating slopes, the party re-entered Sullivan County and, proceeding eastward to Forksville, climbed up to the wild plateau country lying to the north of Eaglesmere. Here the party was split into groups or teams to facilitate the exploration of all the available habitats. A cranberry bog along Double Run yielded Cassandra *(Chamaedaphne calyculata)*, Mountain Holly *(Nemopanthes mucronata)* and a rare northern species of Cotton-grass *(Eriophorum spissum)*. Deep wooded hillslopes harbored colonies of *Hepatica acutiloba* and *Oxalis montana*, good northern species. One team brought in the first Mountain Ash *(Sorbus americana)* of the trip, another had discovered the trailing dwarf raspberry *(Dalibarda repens)*, and so on, each team presenting its own finds for the rest of the party to admire or disparage, depending upon whether or not they themselves had found them.

A brief stop was made at the picturesque Lincoln Falls, along Elk Creek, to visit one of the few localities within the state for the very rare Slender Cliff Brake *(Cryptogramma Stelleri)*. This attractive little fern grows on the bare ledges of the rocky gorge just below the Falls.

Leaving Sullivan County, the bus now headed northeastward into Bradford County, landing the party late in the afternoon at Wyalusing Rocks along the East Branch of the Susquehanna. By postponing dinner until dark the party was able to take advantage of the splendid botanizing here offered by the steep cliffs, the river shore and a deep wooded ravine, the last-named all-too-hastily scanned in the failing light.

On Thursday, June 9, the expedition returned to Sullivan County, stopping first at a mine site, east of Mildred. Here a large collection on fossil plants was made first at a mine site, east of Mildred. Here a large collection of fossil plants was made on the slate piles and the first Hairy Blueberry *(Vaccinium canadense)* of the trip was collected. The greater part of the day was employed in working the area around Lopez. Here again the practice of dividing the party into groups of two or three each was adopted with gratifying results. Probably the outstanding discovery of the day was a fine colony of the rare *Polemonium Van-Bruntiae*, found by Mr. Paul Wagner along Cold Run, southeast of Lopez. Among the worthwhile finds brought in by the various parties were *Abies balsamea, Calla palustris, Arisaema Stewardsonii* and *Habenaria orbiculata*.

That evening saw the party back at Willow Springs, where the first night had been spent. This time a small delegation was dispatched to the far or south side of the river and came back with a whole new lot of species including the very uncommon *Rumex altissimus*.

On Friday, June 10, the bus headed for home. Only one important stop was made, that in Luzerne County along the Big Nescopeck Creek, north of Conyngham. No unusual species were found, but an intensive scouring of the woods and stream banks yielded a large and varied collection, which will go far toward filling in our knowledge of distribution within this county.

That the 1938 trip was eminently successful may be gathered from the fact that the combined collections of the party totaled over 1300 numbers. These have now been mounted and inserted in the University Herbarium, as a result of which five counties, about which comparatively little had been known, are now substantially represented by specimens, and our steadily growing body of knowledge of the flora of the state has been materially increased.

JOHN M. FOGG, JR.

BOTANICAL ACTIVITIES OF THE ARBORETUM STAFF

EDGAR T. WHERRY

Dr. Wherry spent the summer studying the habits of native ferns from Connecticut to South Carolina, traveling over 10,000 miles and collecting about 500 specimens. The most notable find was a colony of Slender Rock-brake, *Cryptogramma stelleri,* in West Virginia, 200 miles south of its previously known limit in northern Pennsylvania.

H. H. YORK

As Special Investigator and Consulting Forest Pathologist for the New York State Conservation Department, Dr. York devoted the past summer to continuing his investigations on diseases of coniferous trees in forest plantings. The greater portion of his time was spent in the municipal forest plantings of the City of Rochester, New York, which are located on the watersheds of Hemlock and Canadice Lakes. These watersheds comprise approximately 3000 acres and constitute the second largest municipal forest plantings in the country, those of New York City being the largest.

Dr. York also made a number of trips to the Morris Arboretum, where he directed a pathological survey carried on by Messrs. Spencer Davis and John Harry, graduate students in Forest Pathology at the University of Pennsylvania.

JOHN M. FOGG, JR.

Dr. Fogg spent the month of July at the Mountain Lake Biological Station at Mountain Lake, Virginia, where he again taught in the summer session of the University of Virginia. He also assembled a large collection of plants from this interesting region for the University Herbarium.

During August, Dr. Fogg made two field trips, one to the foothills of the Adirondacks and another into central and western Pennsylvania, where extensive collections were made in counties in which little or no botanical work has been done.

JAMES LAMBERT

Mr. Lambert, superintendent of the Arboretum, drove westward to San Francisco, where he got a collection of specimens of rare plants from the Golden Gate Park. He drove south and collected plants in the Sierra Mountains arriving in San Diego, thence east across Arizona, New Mexico, and finally to Florida. Special attention was given to the *Dionaea* and *Sarracenia* forms in the Southern States. Over 100 living plants were brought to the greenhouses at the Arboretum for cultivation.

J. W. ADAMS

Mr. Adams, Assistant in the Herbarium, in company with Dr. E. T. Wherry, visited the Stewartstown area, York County, Pennsylvania, in the spring, to study Harford County, Maryland, and in Fulton, Bedford and Somerset Counties, Penn-

Hartford County, Maryland, and in Fulton, Bedford and Somerset Counties, Penn-

sylvania. Perry County, also, was visited in the summer.

F. RAYMOND FOSBERG

Mr. F. Raymond Fosberg, Morris Arboretum Fellow, spent most of the summer working in the Herbarium at the University of Pennsylvania on taxonomic studies of Hawaiian plants. He made three visits to other herbaria—one to Washington, one to the Gray Herbarium at Cambridge, Massachusetts, and one to the New York Botanic Garden.

In addition, Mr. Fosberg collected plants in Southern Virginia, Northern Pennsylvania, the Adirondack Mountains, and in New Jersey. Altogether, approximately 2000 specimens were collected by him.

ERNEST LUDWIG

Mr. Ernest Ludwig, a graduate student in Botany at the University, was appointed to a fellowship, granted by the "Friends of the Wissahickon," to make a thorough study of the present flora of the Wissahickon Valley. This was begun during the summer under the supervision of Assistant Professor John M. Fogg, Jr.

RODNEY H. TRUE

In the early part of August trips were made in quest of plants found in the calcareous northern part of Warren County, New Jersey.

The latter half of the month and the early part of September were spent in company with Oliver M. Neal, Jr., of the University of Maine, in collecting in Northern Maine. Collections were made from Mattawamkeag to the St. John River in Penobscot, Aroostook and Washington counties. The northern limits of the more southern flora, and the southern appearance of plants from a more northern range, were in evidence. About 1200 specimens were collected for the Herbarium during the summer.

ORGANIZATIONS VISITING THE ARBORETUM IN 1938

The classes from the Department of Botany of the University of Pennsylvania have made frequent visits to the Arboretum. Various other scientific and educational institutions have been represented by groups varying in number from a dozen to fifty. Among them the following may be mentioned: National Association of Gardeners, Philadelphia branch, Mt. St. Joseph group, Oak Lane Country Day School, Garden Club of America, Methodist Deaconess Home, the Lawrenceville School, the choir of St. Thomas' Church, Temple University group, Springside Junior School, Academy of Natural Sciences group, New Century Club, Botanical Society of Pennsylvania, Education Alumni Association of the University of Pennsylvania, Ambler School of Horticulture, Business and Professional Women's Club, Matinee Music Club, and Pi Lambda Theta party.

Perhaps the greatest number of organizations visiting the Arboretum belonged to the Garden Clubs. The following clubs were officially represented by groups: Garden Club of Wallingford, Somerton Woman's Club, Bywood Woman's Club, Twin Valleys Garden Club, Norristown Garden Club, Countryside Garden Club, Moorestown Garden Club, Four Counties Garden Club, the Planters Club of West Chester, Woman's Club of Woodstown, New Jersey, and the Penn Valley Garden Club.

The outing groups came as organizations. Among them were the Back to Nature Hiking Club, a group of boys from Dr. Krasnoff's camp, and the Field Club of the University of Pennsylvania.

VISITORS FROM GERMANY

Among our many visitors at the Arboretum was a group of members of the German Dendrological Society sent to America to study American arboreta. Plans for the planting of three extensive arboreta in Germany are now being made, and a committee of experts is studying American institutions of this type. The Committee, consisted of the following members: President, Herr von Schroeter, the two Counts Henckel von Donnersmark and Herr von Madgeburg, accompanied by Mr. H. F. Riebe, of the Henkel & McCoy Company.

The itinerary of this Committee followed the recommendations of Dr. Hellmut L. Spaeth, of the long-established firm of Spaeth, Berlin, who paid the Arboretum a previous visit on March 23rd. It was understood that the inspection of the Morris Arboretum was the first of a series of such inspections, which would include the Arnold Arboretum, of Boston, and the Morton Arboretum, of Lisle, Illinois.

THE WINTER LECTURE COURSE

DURING the coming winter a course of five lectures, on topics of interest to persons caring for plants, will be given in the Mansion at the Arboretum. The speakers will be authorities on the subjects, and illustrations will add interest to the lectures. Lawns and hedges will be the prominent subjects of discussion, and the course will be closed by the consideration of a novel subject. The program follows:

December 10, 1938

DR. E. M. GRESS — *Grasses—I.*

Dr. Gress, Botanist, State Department of Agriculture, will discuss the general subject of grasses. He studied at Bucknell College, and took his advanced degree at the University of Pittsburgh. He has been a teacher. He has published papers on various botanical subjects, his excellent bulletin on the "Grasses of Pennsylvania" being his latest major work.

January 14, 1939

DR. JOHN MONTEITH, JR. — *Grasses—II.*

Dr. Monteith, who is a Pathologist in the U. S. Department of Agriculture, will discuss phases of the grass problem seen in lawns and golf courses. He received his early training at Rutgers University, taking his higher degrees at the University of Wisconsin. He has been with the Department at Washington since 1923.

February 11, 1939

MR. HARRY WOOD — *Hedges—I.*

Mr. Wood is connected with the Arthur Hoyt Scott Foundation of Swarthmore, Pennsylvania, and has had wide experience in America and in England in practical horticulture. He will discuss the general subject of hedges, materials used, purposes sought, and treatment given to hedges.

March 11, 1939

MR. R. W. OLIVER — *Hedges—II.*

Mr. Oliver, of the Central Experimental Farm at Ottawa, will discuss hedge problems and materials, presenting the results of novel work on hedges being done at Ottawa. Visitors seeing this work speak highly of the results.

April 15, 1939

MRS. A. C. BARNES — *Cultivation of Hardy Ferns*

Mrs. Barnes is Director of the Arboretum of the Barnes Foundation at Merion, Pennsylvania, and has given special attention at the Barnes Arboretum to the cultivation of a very large number of hardy ferns, one of the attractive and novel features of this very beautiful and interesting institution.

The Arboretum of the Barnes Foundation was started in 1922, when the property was acquired from the late Captain Joseph Lapsley Wilson, who made it a condition of the sale contract that the plantings of trees begun by him in 1887 should be preserved. At present, the Arboretum contains about 1,250 species and varieties of woody plants, including some rare and unusual trees, 250 Lilacs, 245 Roses, Cotoneasters, Barberries, broad-leaved evergreens, etc., which, together with the 88 species and varieties of hardy ferns in the woods, form a collection containing well-developed specimens of decorative as well as horticultural interest.

Lectures will begin at 2:30 P. M. Guests coming in cars will find convenient parking space near the entrance on Meadowbrook Lane.